



# Spaceport News

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John F. Kennedy Space Center

## Next mission to add to Space Station port side, rotate crews

**M**ission STS-113 (11A) is the 16th International Space Station assembly mission. This is Endeavour's 19th flight and the 112th Shuttle mission. Launch at press time was set for Nov. 10.

The primary objectives of the 11-day mission are to deliver the Expedition 6 crew and Port 1 (P1) Integrated Truss Segment (ITS) to the Station.

Mission specialists will use the Station's robotic arm to remove the P1 truss, the Station's first left-side truss segment, from Endeavour's payload bay and attach it to the Station port side of the S0 Truss. The truss' primary function is to provide the heat transport and heat rejection capability required for the Station's active thermal control system.

The primary cargo element, P1 is the third truss segment of the main Station ITS, a 46-foot by 15-foot structure weighing about 27,500 pounds.

The ITS will eventually be used to support the four power-generating photovoltaic modules of the Station and the permanent External Active Thermal Control Subsystem (EATCS), and will also provide a translation path for the Mobile Servicing System along specially designed truss rails.

The truss rails allow the Space Station Remote Manipulator System to be positioned at various locations along the truss for performing maintenance tasks and element installations and providing spacewalk assistance.

The mid-deck of Endeavour will be filled with various Station



The crews of Mission STS-113: From left are STS-113 Pilot Paul Lockhart; Expedition 6 Commander Ken Bowersox; STS-113 Mission Specialists Michael Lopez-Alegria and John Herrington, and Commander James Wetherbee; Expedition 6 astronaut Donald Pettit and cosmonaut Nikolai Budarin.

assembly-related hardware, logistics and payloads on Mission 11A. This includes spacewalk tools and equipment, Portable

Computer System items, Crew Health Care System items, photo/

(See STS-113, Page 7)

### Inside

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## Space Launch Initiative at KSC seeks safety, cost reduction goals

**K**ennedy Space Center manages the Operations Project of the Space Launch Initiative (SLI). Through SLI, NASA will define, develop and test the technologies needed to make space transportation safer and less expensive. Marshall Space Flight Center in Huntsville, Ala., manages SLI for NASA's Office of Aerospace Technology.

Ground operations include advanced checkout and control systems, separation systems, ground-to-flight interfaces, range operations and fluid transfer technologies.

"Getting into space is expen-



Artist's rendering of RLV.

sive and inherently risky. The SLI program has the two major goals of increasing safety and decreasing the cost of getting into space," said Warren Wiley, KSC's SLI project manager.

"SLI is also developing the

technologies that are needed to build a next generation RLV," said Wiley. "It has been cited that 80 percent of the life cycle cost of a new system is set at concept definition. This is the opportunity to infuse our operations knowledge into the vehicle to ensure the next generation RLV is successful."

A team of contractors supports KSC's SLI endeavors. This team comprises Ohio-based companies Sierra Lobo, Inc., PHPK Technologies, and Boeing Phantom Works (Calif.).

To increase the amount of propellant carried by the vehicle and increase performance, PHPK is developing a packed column

(See SLI, Page 6)

# Recognizing Our People

**K**ennedy Space Center inventors are setting the bar for the technological world once again. More than 100 employees received recognition at the Oct. 8 Sixth Annual KSC Space Act Awards Luncheon.

In a remarkable feat, KSC earned more Space Act Award dollars than any other NASA center for the third consecutive year.

The fiscal year 2002 award amount of \$190,850 is proportionately divided among four areas of awards.

Center Director Roy Bridges Jr., Technology Commercialization Office Chief Jim Aliberti and Spaceport Engineering and Technology Director Jim Heald welcomed the inventors to the KSC Visitor Complex Debus Center. Award Liaison Officer Pam Bookman announced the recipients and their inventions while Robin Flynn distributed the awards (see below).

As the guest speaker, NASA Headquarters'

Inventions and Contributions Board Staff Director Walter Hussey challenged guests: "Innovations of the future must surpass innovations of the past!"

Among the winners, who individually received \$500 to \$21,000, was retiree and exceptional Space Act Award recipient, Adam Kissiah, father of the cochlear implant.

Other standout winners included Charles Curley and David Floyd, Dynacs software developers for the Hazardous Gas Detection System 2000 Software (HGDS 2000).

J. Edelmann, the NASA HGDS 2000 project manager, led the HGDS 2000 team that came in second place for NASA's Software of the Year award. The award garnered \$23,000 to be divided between the two Dynacs inventors.

"The abort of STS-93, 1.2 seconds prior to Main Engine ignition, is an excellent example of the importance of the Hazardous Gas Detection System to the Shuttle Program and

our ability to launch safely," said Edelmann.

HGDS 2000 detects Space Shuttle vehicle hydrogen and oxygen cryogenic leaks during launch preparations. It provides real-time quantitative gas analysis data for orbiters, the External Tank and hydrogen umbilicals. Also, this is a Criticality 1 Safety System used to detect low-level gas concentrations.

An operational HGDS is a mandatory Launch Commit Criteria for External Tank loading operations and launch. HGDS 2000 systems and software are integrated into each of the three Mobile Launcher Platforms and two Control Rooms without any impact to schedule or decreasing operational safety.

The production systems and software supported processing and launch of missions STS-109, STS-110, STS-111 and STS-112. It also helped isolate and identify a hydrogen leak on the Shuttle Endeavour.

## 2002 Space Act Award Recipients

### NASA

<i>Ric Adams</i>	<i>Angel Lucena</i>
<i>Berta Alfonso</i>	<i>Dale Lueck</i>
<i>Dennis Armstrong</i>	<i>Louis MacDowell, III</i>
<i>Richard Arnold</i>	<i>Pamela Meier</i>
<i>Guy Bedette</i>	<i>Frank Merceret</i>
<i>Greg Breznik</i>	<i>Carolyn Mizell</i>
<i>David Collins</i>	<i>Paul Mogan</i>
<i>Susan Corbin</i>	<i>Carolyn Paquette</i>
<i>Edwin Cortes</i>	<i>Clyde Parrish</i>
<i>Karim Courey</i>	<i>Jose Perotti</i>
<i>Carl Delaune</i>	<i>Kathy Potter</i>
<i>James Fesmire</i>	<i>Jacqueline Quinn</i>
<i>Christopher Forney</i>	<i>Jorge Rivera</i>
<i>John Fraley</i>	<i>Eric Schafer</i>
<i>Timothy Griffin</i>	<i>James Simpson</i>
<i>Phil Gvozdz</i>	<i>Matthew Smisor</i>
<i>Gregory Hall</i>	<i>Felix SotoToro</i>
<i>Wyck Hebert</i>	<i>Charles Stevenson</i>
<i>Bill Helms</i>	<i>Bill Toler</i>
<i>Thomas Herring</i>	<i>Ivan Velez</i>
<i>Frank Howard</i>	<i>Jeffery Vickers</i>
<i>Curtis Ihlefeld</i>	<i>Robert Youngquist</i>
<i>Adam Kissiah Jr.</i>	<i>Jan Zysko</i>
<i>Bill Larson</i>	<b>Dynacs</b>
<i>Chau Le</i>	<i>Robin Anders</i>
<i>Lewis Lineberger</i>	<i>Stan Augustynowicz</i>



Members of the Technology Commercialization Office are recognized for helping others receive awards.

*Brad Burns*  
*Robert Chiodini*  
*Robert Cox*  
*Charles Curley*  
*Joseph Curran*  
*Richard Deyoe*  
*Anthony Eckhoff*  
*Edward Farrar*  
*David Floyd*  
*Jay Garland*  
*Terry Greenfield*  
*Carl Hallberg*  
*Bill Haskell*  
*Jim Henderson*  
*Keith Heob*

*Tim Hodge*  
*Richard Hritz*  
*Christopher Immer*  
*Max Kandula*  
*Chris Kerios*  
*Steven Klinko*  
*John Lane*  
*Francisco Lorenzo-*  
*Luaces*  
*Carlos Mata*  
*Carl Mattson*  
*Robert McLaughlin*  
*Pedro Medelius*  
*Zoltan Nagy*  
*Guy Naylor*

*David Penca*  
*Donna Porter*  
*Barry Rubel*  
*Pamela Schmidt*  
*Angela Smibert*  
*Stan Starr*  
*Stephen Stout*  
*Robert Swindle*  
*John Taylor*  
*Ivan Townsend*  
*Paul Yocom*

**USA**  
*Duane Balkema*  
*Richard Beck*  
*George Berry*  
*Tom Bigelow*  
*Daniel Drake*  
*Rick Edwards*  
*Chris Ehrenfeld*  
*Shawn Ford*  
*David Grom*  
*Chuck Harnden*  
*Bonnie Hauge*  
*Donald Johnston*  
*Michael Katz*  
*Bryan Keen*

*Bob Kemmerling*  
*Anthony Kraljic*  
*Kenneth Lathrop*  
*William Moore*  
*Wayne Morse*  
*Mike Olejarski*  
*Kenneth Reaume*  
*Arlene Reese*  
*Richard Ring*  
*Gerald Sawasky*  
*Stephen Schneider*  
*Robert Small*  
*Glen Torrey*  
*Charles Walker*

**Boeing**  
*Clifton Burkett*  
*Dan Dvorak*  
*Edward Fambrough*  
*Robert Mraz*  
*Andrew Salaka*  
*Benjamin Smith*  
*Orlando Torres*  
*Bill Valentino*  
*Alan Zide*

(See AWARDS, Page 3)



## KSC Customer Service Day awards employees for commitment

Kennedy Space Center's Customer Assurance and Analysis Office hosted its annual Customer Service Day, Oct. 9, with a special program at the Training Auditorium. Space workers arrived at the auditorium by foot and automobile, and many by Harley motorcycle, to attend the morning's special events.

Acting Deputy Center Director and Director of External Relations and Business Development JoAnn Morgan welcomed the standing room only audience: "This year's Customer Service Day is the biggest and best yet. KSC is an advocate for customer service satisfaction."

During his opening remarks, Center Director Roy Bridges Jr. said, "In this changing world we live in, it is essential that we continue to service our KSC customers, staying true to our guiding principle, 'Satisfy Our Customers' Needs Anytime, Anywhere.'"

Bridges continued, "We will continue growing in this area. We are a critical link in the NASA chain."

Michele Foster, chief, Customer Assurance and Analysis Office, introduced the keynote speakers Al Doty, Paint Process lead and Doug Vanderslice, Paint Process co-lead, from Harley-Davidson in Kansas City, Mo. The pair took the stage and shared the Harley-Davidson story and how the company fulfills its customer service commitment to



Acting Deputy Director JoAnn Morgan joins Giselle Altman at the podium for Customer Service Day, which featured speakers from Harley-Davidson. More than 190 individuals and teams were nominated for Gold Dollar Awards.

its external and internal customers, and employees.

According to Doty, Harley-Davidson's return to prosperity in the late 80s from almost closing its doors in the 70s can be attributed to a unique partnership among management, its workers, the union and its customers. "We supply our customers what they need."

And Vanderslice added, "It's all about customer satisfaction. The company makes it a point to hear what its customers and employees want."

Doty and Vanderslice also shared the company's new mission statement with the rapt audience: "We fulfill dreams through the experiences of motorcycling."

During the morning program Bridges awarded several teams and individuals the Gold Dollar Award.

The recipients were The MARS Reconnaissance Orbiter Launch Vehicle Acquisition Team members Ayman Abdallah, Brian Beaver, Larry Craig, Tammy Harrington, Doug Lindhorst, Ed New, Roger Sarkovics, Dave Sollberger, Jackie Simon, Geff Swanson, Joe Roeder, Tom Tokmenko and Frank

Valdes; the KSC Commercialization Team members Jim Aliberti, Pam Bookman, Dan Culbertson, Carol Dunn, Robin Flynn, Chuck Griffin, Randall Heald, Lynne Henkiel, Jeff Kohle, Dave Makufka, Jim Nichols, Lewis Parrish, Joe Robles, Theresa Rumbaugh, Brian Sauser, Joel Shealy and Jennifer Van Pelt; the JBOSC Customer Outreach Team members Bill Gammon, Charlene Killough, Rick Kowalchik, Nate Pains and Robert Wood; the NASA/ISS Employee Survey and Improvement Team members Chris Comstock, Cindy Lodge, Jennifer Kunz, Melodie Porta, Dawn Schaible and Joe Tellado; and the IDI Library Support for

Technical Documentation Team members Sandra Courson and Jane Page.

Individual Gold Dollar Award recipients were: Mary Jo Denton, United Space Alliance; Jack Keifenheim, NASA, ISS; Cindy Kirkpatrick, NASA Spaceport Services; Laurie Lockridge, SpaceMark, Inc.; Al Menendez, EDC Subcontractor for CLCS; Paul Peabody, USA; John Ripka, SGS; Laura Scott, InDyne Inc.; Eve Stavros, Boeing; and Maret Tennison, NASA Human Resources.

More than 190 teams and individuals were nominated by their peers. The awards were based on customer service criteria including going "above and beyond" the call of duty to meet either internal or external customer needs; displaying exemplary efforts or results in service of internal or external customers; and working to change policies or procedures that focused on customer satisfaction.

Suggestions for next year's Customer Service Day may be submitted to:  
[customerserviceday2003@ksc.nasa.gov](mailto:customerserviceday2003@ksc.nasa.gov).

### Awards. . . (Continued from Page 2)

<b>ANALEX</b> <i>Anthony Culotta</i>	<b>Space Gateway Services</b> <i>Matthew Truell</i>	<b>X-1R Corporation</b> <i>Chris Fornili</i> <i>E. T. Longo</i> <i>Jim Sandler</i>
<b>ENSCO, Inc.</b> <i>Jonathan Case</i> <i>Alan Dianic</i> <i>John Manobianco</i> <i>Greg Taylor</i> <i>Mark Wheeler</i>	<b>COMPAQ Computer Corporation</b> <i>Joe Prevo</i>	<b>INDYNE, Inc.</b> <i>Hans Siepmann</i>
<b>Federal Data Corp.</b> <i>Ryan Ackley</i>	<b>Comprehensive Health Services</b> <i>Garry Palmer</i>	<b>Lockheed-Martin Space Operations</b> <i>Christopher Tower</i>



### 2002 Employees of the Year

Back Row – Left to Right: Michael Dininny (YA), Ayman Abdallah (VA), Bob Monson (QA), Darcy Miller (PH); Front Row – Left to Right: Johnny Mathis (UB), Suzie Stuckey (CC), Gloria Marsh (OP), Loretta Dreier (BA) and Patty Jordan (GG).

# KSC grows with new facilities for workers

With this year's construction of several new Launch Pad facilities nearing completion, and plans in the works for several more new facilities in various locations, Kennedy Space Center continues its commitment to replace substandard housing for the Center's space workers.

Currently at Launch Pads 39A and 39B, several boxcars and trailers are being eliminated and two 30,000-square-foot support buildings are under construction. Also, two 5,000-square-foot operations buildings, one at each pad, are being modified to provide materials storage and distribution space.

The pad facilities will move personnel and operations out of deteriorating facilities and also help consolidate personnel into one building at each pad. This decreases the Center's maintenance requirements and increases the efficiency and morale of the personnel, said Bruce Kinnaird, project lead design engineer, NASA Spaceport Services.

The new buildings will be a mix of office and shop space with each providing office space for NASA, United Space Alliance and subcontractor personnel. They include pad operations managers, quality and safety personnel, system engineers, planners and schedulers and shops for the cryogenic, hypergolic, electrical and environmental control systems. They will also house personnel for payload, external tank/solid rocket boosters and Space Shuttle main engine operations at the pads.

Other new facilities currently in the works are the Shuttle Landing Facility (SLF) Replacement Air Traffic Control Tower (ATCT) and the Operations Support Building (OSB) II in the Launch Complex 39 area.

Construction on the new SLF Control Tower began in August and is scheduled to be completed in July 2003. The new facility will accommodate Space Gateway Support Air Traffic Controllers and contractor weather personnel. An elevator in the tower will provide for both personnel and freight lift to the floor just beneath the tower cab.

The cab will provide an unobstructed 360-degree view of the surroundings. Weather personnel will

be able to observe conditions from bay windows and an outside platform. Airfield lighting controls, various radar displays and communications equipment will be installed in the cab during activation.

"The new tower facility will bring us into the 21st Century. This tower will enhance airspace security as well as

enabling controller personnel to better serve the Spaceport mission," said Ed Taff, NASA SLF Operations officer.

The new ATCT will be located east of the runway, adjacent to the SLF runway midfield site.

OSB II construction is scheduled to begin soon. The new building will replace the 198,000 square feet of existing modular

housing and trailers in the LC 39 area.

OSB II will be an 189,000-square-foot five-story building. It will support operational areas and consist of 860 office spaces for NASA, USA, SGS, Boeing and other subcontractors, 16 training rooms designed to hold 400 people, computer rooms and multi-media conference rooms.



One of two new buildings being constructed on Launch Pads 39A and 39B. The new facilities will be a mix of office and shop space.

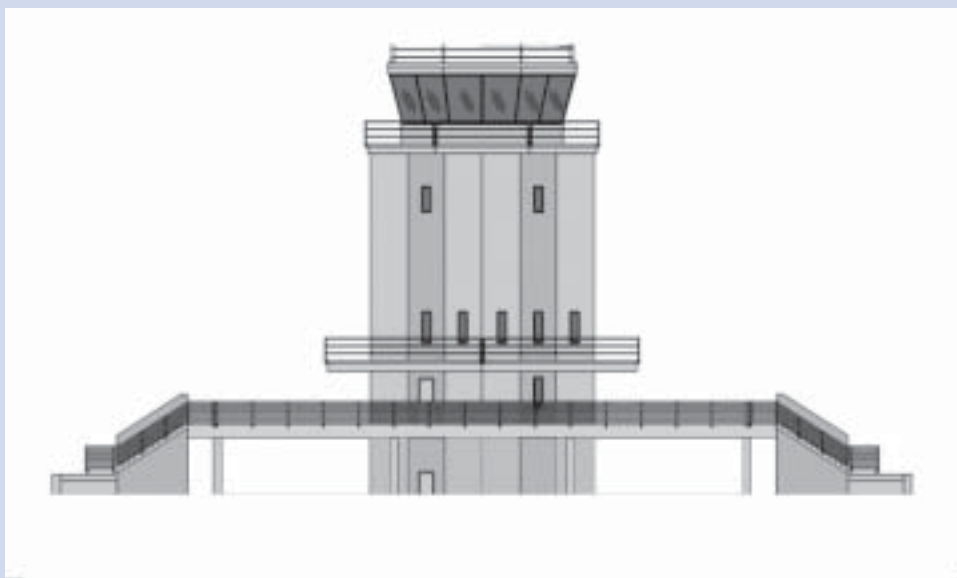


Rendering of the east side of the OSB II, which will replace modular housing and trailers in the Launch Complex 39 Area. It will feature a rooftop observation deck, technical libraries, Exchange store, support areas and parking.





Space Experiments Research and Processing Laboratory (SERPL) is approximately 50 percent complete with a target construction completion date of August 2003.



A rendering of the new Air Traffic Control Tower soon to be under construction on the Shuttle Landing Facility.

According to Don Minderman, NASA project manager with Spaceport Services, the building will also feature a 352-person Mission Conference Center with a rooftop observation deck, technical libraries, exchange store, miscellaneous support areas and parking.

The OSB II will be constructed in two phases. Phase I will replace trailer complexes K6-1200A, B, D,

E and K. Phase II will replace trailers K6-1200C, F, G, H, I, J and TRM-019.

"The new facilities recently completed and those that are in the works represent a firm commitment by Kennedy Space Center to provide a safe, efficient and attractive work space for our KSC Team at the Center," commented KSC Center Director

Roy D. Bridges Jr.

The Substandard Housing Replacement program is part of KSC's Safety and Health Initiative that began in 1999 with an agreement between the Administration, Congress and NASA Headquarters. Construction of Facilities Program funding of \$46 million is allocated to construct 15 permanent replacement facilities.

Funds to continue construction of new facilities are allocated throughout the current Construction of Facilities Program 5-Year Plan.

Other construction includes the Space Experiments Research and Processing Laboratory (SERPL). According to Jan Heuser, chief, NASA Spaceport Technology Business Development office, the facility is approximately 50 percent complete with a target construction completion date of August 2003. The facility is expected to be operational by February 2004.

When complete, the facility will house the Life Sciences Support Contractor, Dynamac, along with researchers and life sciences principal investigators. The Space Agriculture Biotechnology Research and Education (SABRE) program will also be located in the SERPL facility.

Facilities recently completed at KSC include the Hypergol Support Building in the Hypergol/Payload Test area, the SCAPE (self-contained atmospheric protective ensemble) Support Building near pads 39A and 39B, and the Convoy Operations/Landing Aids Complex at the SLF tow-way.

## KSC team demonstrates flight processor for space-based project

Groundbreaking developments constantly improve today's technology, and the Space Launch Initiative's Space Based Telemetry And Range Safety (STARS) project continues the tradition by impacting the future of space travel.

On Sept. 12, Lead Software Designer Chris Forney demonstrated the capabilities of the STARS Command and Data Handler (C&DH) flight processor, developed by KSC civil servants.

"The STARS project is a critical component of KSC's strategic move into range technology development," said Jim Heald, Spaceport Engineering and Technology director. "The engineering and program management inherent in the STARS project is a testament to the innovative skills of the KSC workforce."

Unlike present methods,

STARS will demonstrate the capability of a space-based platform to provide range safety and range user support for a variety of launch vehicles. "STARS will help prove the concept of a space-based range," said Heald. "Space-based ranges are critical to reducing the high cost of maintaining an older ground-based, down-range infrastructure."

Range Safety support includes flight termination processing from both space and ground assets and vehicle tracking using the Global Positioning System (GPS) satellites. Range User support includes high return link data rates for voice, video and vehicle data.

STARS will demonstrate, in flight, the ability to provide vehicle position tracking data during over-the-horizon flight operations. It will also determine feasibility of forward and return



Erik Denson, lead engineer (right), explains the significance of C&DH technology to (from left) Temel Erdogan, Ken Payne and Jim Heald.

satellite links for real-time monitoring. STARS will use existing, proven satellite systems such as TDRSS and GPS to provide reliable communications and minimize flight demonstration risk.

As a result of the streamlining, STARS plans to reduce the cost of delivering payload to orbit by reducing ground operation costs, which sequentially supports NASA's Space Launch Initiative (SLI). According to STARS Project Manager Lisa Valencia, estimates show that using these methods could reduce costs by up to \$40 million per year.

Along with KSC (the STARS' program management center), the Dryden Flight Research Center, Wallops Flight Facility, Goddard Space Flight Center, Glenn Research Center, White Sands Complex, and Marshall Space Flight Center all have project responsibilities.

STARS flight demonstrations are scheduled to begin at Dryden in 2003. "The project could be considered a great example of NASA Administrator Sean O'Keefe's vision of One NASA," said C&DH Lead Engineer Erik Denson.

## SLI...

*(Continued from Page 1)*

cryogenic densification system for the second Generation Reusable Launch Vehicle Program (2GRLV). According to densified propellant technical lead Bill Notardonato, this method uses a similar process as a water-cooling tower.

"This densification approach is considered favorable to existing systems due to its inherent simplicity and reliability," said Notardonato. "One apparent disadvantage is the high consumption of gaseous helium, an expensive and nonrenewable resource. Helium recovery techniques are being investigated as part of the project."

KSC also manages the **Advanced Checkout, Control and Maintenance Systems (ACCMS)** element, which includes artificial intelligence applications, data analysis and retrieval technologies, architectures (designs) supporting multiple vehicles, vehicle health systems and data communication systems.

"The ACCMS brings all

aspects of Reusable Launch Vehicle ground and flight operations into an integrated system," said Bill Findiesen, Boeing's SLI principal investigator. "Data systems are all integrated to dramatically reduce operations and sustaining costs while achieving advancements in safety."

**Fluid transfer technologies** will minimize timelines for fluid filling and draining. Technologies include robust cryogenic components, and instrumentation/sensors to monitor fluid transfer.

KSC engineers continue testing the latest in this field — the "Smart" Umbilical Mating System. "The concept is to replace a T-0 umbilical with an automated umbilical that has a mate, demate and remate capability," said Tom Lippitt, Spaceport Engineering and Technology lead engineer.

"The ability to quickly and reliably mate and demate umbilical connectors under automated control, along with remote connection verification, would reduce the time and labor hours required to prepare for launch. The system will also be used as a test bed for quick disconnect develop-

For more SLI information, including artists' concepts of vehicles, visit [www.slinews.com](http://www.slinews.com). Information on the contractors supporting SLI can be found at [www.sierralobo.com](http://www.sierralobo.com), [www.phpk.com](http://www.phpk.com) and [www.boeing.com/phantom](http://www.boeing.com/phantom).

ment and for advance control and leak detection technologies."

In February, Sierra Lobo, contracted for their Densified Propellant Management System (DPMS), won the prestigious R&D 100 Award for the Cryo-Tracker™, a liquid level and temperature sensor for cryogenic liquids. The DPMS and Cryo-Tracker™ technology will produce, maintain and mass-gauge densified cryogenic liquids for 2GRLV. Sierra Lobo is the only contractor working on an SLI mass-gauging system.

In the area of **Range Operations**, KSC leads in technologies for ground and space-based range systems, weather instrumentation, information systems and decision models such as toxic dispersion, blast and plume impact.

An example is the STARS (Space-based Telemetry And Range Safety) project. STARS will simultaneously track numerous

signals to and from aircraft/launch vehicles. The project requires less communication, manpower and maintenance costs. Other benefits include a decreased launch turnaround time and the ability to launch second-generation vehicles from any U.S. spaceport.

On April 30, through SLI, NASA came one step closer to choosing a successor to the Space Shuttle. Three contractor teams — The Boeing Company, Seal Beach, Calif.; Lockheed Martin Corp., Denver, Colo.; and a team including Orbital Sciences Corp., Dulles, Va., and Northrop Grumman, El Segundo, Calif., are pursuing a handful of possible designs.

According to Wiley, the technologies being developed for SLI may apply to the Shuttle Upgrade program too. "It is important to keep in mind they may be integrated into the Shuttle for potential flight testing and as a safety upgrade," he said.



## Meteorite study may provide science community, industry knowledge for advanced material design

A NASA study of a one-of-a-kind meteorite found 36 years ago in Australia could help provide the science community and industry with fundamental knowledge for use in the design of advanced materials.

Such materials could be used for future spacecraft, improved jet aircraft and in various manufactured goods from cars to household materials. In addition, the meteorite — now at Kennedy Space Center — could help reveal secrets about the core of our planet and its magnetic field.

The 100-pound Mundrabilla meteorite sample, which is on loan to Marshall Space Flight Center from the Smithsonian Institution's National Museum of Natural History, is being studied by MSFC and KSC, primarily through the use of KSC's Computed Tomography Scanner.

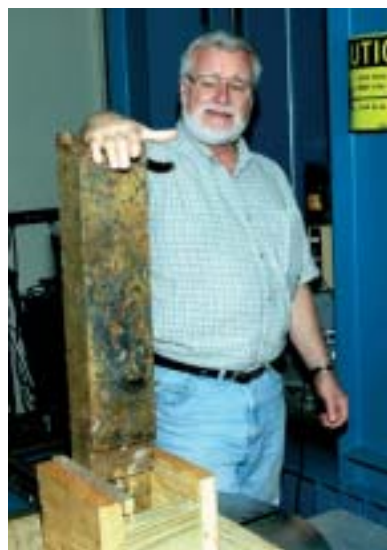
Dr. Donald Gillies, discipline scientist for materials science at

MSFC's Microgravity Science and Applications Department, is the principal investigator on the study.

"Most meteorites are solid chunks of metal, surrounded by a rocky surface. This one is a combination of materials (iron-nickel and iron-sulfide) that became solid at different rates in cooling over millions of years," Dr. Gillies said. "It offers an amazing opportunity for understanding fundamentals of alloy formation."

Pete Engel, an engineering specialist in Wyle Laboratories Nondestructive Testing Laboratory at KSC, has processed the scans of the meteorite at KSC.

"The CT Scanner is able to reveal the untouched internal structure of the meteorite by detecting differences in the densities of its materials," Engel said. "Without a tool like the scanner, it would be impossible to study the inside of the meteorite



Pete Engel, an engineering specialist in Wyle Laboratories Nondestructive Testing Laboratory at KSC, explains the testing being performed on a 100-pound Mundrabilla meteorite sample.

process until every slice of an object is imaged in order to create a 3-D image. Dr. Gillies and Engel are conducting the meteorite CT work at KSC using gamma rays given off by a pencil lead-sized piece of radioactive cobalt as it decays.

"This meteorite, like all meteorites, was formed in a lower gravity environment than here on Earth," Dr. Gillies pointed out. "Like experiments performed on the Space Shuttle or the International Space Station, this research allows us to look at fundamental science questions. Unlike our own flight experiments, this one represents a billion-year solidification experiment in low gravity."

without altering it by sawing into it or grinding it up."

The idea behind computed tomography — first used in the medical field — is to create a picture of a very thin cross-section of an object by passing a very thin fan of X-rays or gamma rays through it and then repeating the

### STS-113... (Continued from Page 1)

TV equipment, water transfer equipment, and Station utilization payloads.

The secondary STS-113 payload is the Microelectromechanical System Based Pico-Satellite Inspector (MEPSI).

MEPSI comprises a launcher, or garage, which houses a set of two small deployable satellites, referred to as PICOSATs. Each PICOSAT weighs approximately 2.2 pounds.

The two miniature satellites will be attached to each other with a 50-foot tether. After release, the PICOSATs will operate on battery power for several days to complete mission objectives.

The purpose of the deployed PICOSATs is to

demonstrate the integration of Microelectromechanical Systems (MEMS) - based subsystems for enabling new technology, low-power, autonomous on-board systems in support of critical satellite operations.

The STS-113 mission crew are Commander James Wetherbee, Pilot Paul Lockhart, and Mission Specialists Michael Lopez-Alegria and John Herrington.

The Expedition 6 crew, Commander Ken Bowersox, Donald Pettit and Nikolai Budarin will replace the Expedition 5 crew and remain on the Station for approximately four months. Expedition 5 crew members returning to Earth are Valery Korzun, Peggy Whitson and Sergei Treschev.

## John Herrington: First tribally enrolled Native American in space

When Endeavour launches this month on Mission STS-113, it will carry seven crew members, and several payloads into space. One crew member in particular will launch aboard Endeavour and walk into Native American history. As Mission Specialist on Mission STS-113, John Herrington is the first tribally enrolled and self-declared Native American to ever travel into space. During the mission he will perform three spacewalks to help install a thermal radiator on the International Space Station.

According to Louise Kleba, of the USA Vehicle Integration Test Team, "John is an honored member of the Chickasaw Tribe, having been inducted into the Chickasaw Hall of Fame. He is an actively involved American Indian, who is recognized as such by American Indian Heritage



John Herrington plays a flute given him by a member of the KSC Native American Intertribal Council.

Groups."

Kleba, herself an Ojibway tribal member affiliated with White Earth Chippewa, says, "Herrington destroys all of the stereotypical images created by Hollywood and those historically portrayed in popular American

(See HERITAGE, Page 8)

# Past meets present, future at 40th Anniversary Picnic

Astronauts representing four decades of manned space flight met with the public Oct. 12 at the Kennedy Space Center Debus Conference Facility to help celebrate KSC's 40th anniversary.

The 40th Anniversary Picnic celebration at the KSC Visitor Complex began with a barbecue lunch, followed by a meet and greet session with the astronauts.

Mercury astronaut Scott Carpenter; Gemini and Apollo astronaut Gene Cernan; Space Shuttle astronaut Jon McBride; and Space Station Commander Brian Duffy signed autographs, as did Guenter Wendt, pad leader during the Mercury, Gemini and Apollo programs. Wendt also signed copies of his book, *The Unbroken Chain*.

A discussion of the past and future of the space program was

presented by the astronauts and KSC Director Roy Bridges Jr., also a former astronaut.

"During the history of the space program we have encountered many obstacles to our success, but we have overcome them one by one," Bridges said. "We must continue to develop as a spacefaring nation, and in that quest we ask you to join us."

Duffy recommended during an interview that anyone who wants to experience the next best thing to being an astronaut on the International Space Station see the 3-D IMAX Space Station movie, now playing at the Visitor Complex.

"I've seen the movie about 150 times during various premieres all over the world and it's still a thrill for me. It puts me back up there again," said Duffy, who now serves as vice president/associate program

manager for Lockheed Martin at Kennedy Space Center.

Duffy said that KSC workers have a proud heritage of safe and successful operations. Duffy, like other astronauts, came to meet and know many KSC workers during his astronaut training and missions.

"As an astronaut I never had any doubt but that the KSC team was doing a perfect job in processing the vehicle and payloads," Duffy said.

KSC worker Art Willet, who serves as launch pad leader for quality, and his wife, Carol, were on hand with other members of the public to enjoy the festivities and meet the astronauts. Willet, a



Former astronauts Brian Duffy (left) and Gene Cernan (right) are joined by a youth who is inspired about the future of space.

Snoopy award winner, said his recently presented Snoopy pin was flown on Duffy's flight.

"I work with astronauts all the time, but my wife doesn't. She just hears all the stories," Willet said. "Events such as this one are great opportunities to share the excitement of the space program with family members."

## HERITAGE... (Continued from Page 7)

press of who, what, and how American Indian heritage peoples have been represented. John is a warm, funny, family oriented man. He is dedicated to his profession and his heritage and manages to walk both paths with equal commitment and without compromise."

He is an honorary member of the KSC Native American Intertribal Council (NAIC) and in 1998 was gifted a flute by Jim Gilliland, a member of the Council, during the NAIC Rocket Garden PowWow that celebrated Native American Heritage Month.

In 1999, John returned to play his flute at the KSC Visitors Complex Theatre as a part of the Celebration of Native American Heritage Month. Native American dancer, Angie Hendrix, of the Comanche Tribe of Oklahoma, gifted him with an Eagle Plume at the celebration. That same year John attended the American Indian Association PowWow in Orlando and the drum sang a special honoring song for him.

During the American Indian Science and Engineering Society (AISES) conference held in Albuquerque last year, Herrington

was honored by the AISES Tribal Elders. He was gifted with the Circle of Life blanket and an Eagle Feather, which is a sacred honor.

Herrington, who will take the Eagle Feather and other sacred gifts into space with him, recently said in *Smithsonian Institution* magazine, "I wanted something to represent my heritage and the heritage of all the Native people. The eagle feather is a symbol that we all identify with and one that we all hold in high esteem."

In addition to astronaut duties, Herrington also serves as a Sequoyah Fellow for AISES and recently spoke to attending AISES members and guests concerning his accomplishments and upcoming flight. He was quoted in the *National Museum of the American Indian, Summer 2002* edition, "This is the greatest thing that we can do as a people. Space travel is one of the greatest accomplishments of human beings."

In *Winds of Change, A Magazine for American Indian Education and Opportunity, Winter 2002*, author Barbra Wakshul says, "We are on the eve of a dream come true."

## KSC Employees Support Juvenile Diabetes Research Foundation 2002 Walk-to-Cure

KSC employees participated in the Juvenile Diabetes Research Foundation, International (JDRFI) 5K Walk-to-Cure Diabetes on Oct. 19. The United Space Alliance team consisted of 37 walkers who collected more than \$9,000 and NASA's team, which consisted of 27 walkers with contributions of more than \$5,000. Boeing, Bionetics, Johnson Controls, Delaware North Park, Dynacs and the KSC Federal Credit Union also had walkers who supported the Walk-to-Cure Diabetes. Brevard County walkers collected more than \$150,000 for JDRFI.

JDRFI is the world's leading nonprofit, nongovernmental funder of diabetes research.



John F. Kennedy Space

## Spaceport News

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